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(54) Accessory for cleaning device

(57) Accessory (10) for cleaning device of the domestic or industrial type, the device able to be a vacuum cleaner of the type for solids, liquids or multi-functional, the accessory (10) including at least an intake pipe (12) equipped with means (11) to connect it to the drive organs of the cleaning device and a cleaning and/or intake element (14) connected at the lower part to the intake pipe (12) with joint or articulated joint

means (13), the cleaning and/or intake element (14) including a first operating position occupying a minimum space and a second operating position occupying a maximum space, the transition from the first to the second position being governed by the activation of drive means (15) cooperating with the handle of the intake pipe (12).

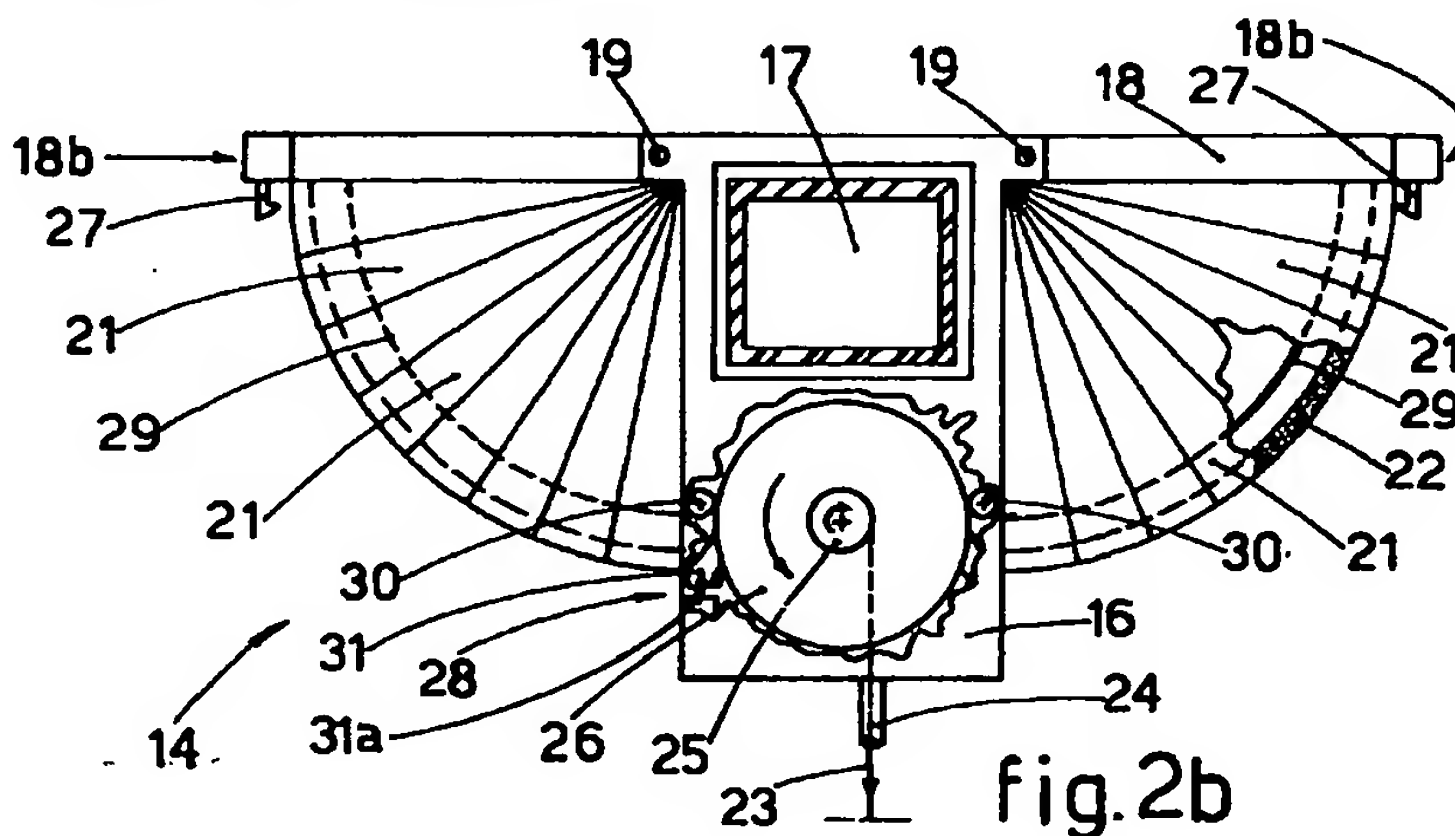


fig.2b

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Description

FIELD OF THE INVENTION

[0001] This invention concerns an accessory for cleaning devices as set forth in the main claim.

[0002] The accessory according to the invention is applied to domestic or industrial cleaning devices to clean extensive surfaces and floors and is particularly efficacious when there are obstacles, corners or areas which are difficult to access.

BACKGROUND OF THE INVENTION

[0003] The difficulties found in cleaning surfaces and floors when there are areas which are difficult to access are well-known to the state of the art.

[0004] Even when the cleaning devices, such as vacuum cleaners and suchlike, include cleaning brushes of limited size, they are not suitable to clean efficiently in corners, or at least they make it very difficult to clean the gaps or spaces formed, for example, between two pieces of furniture or between one piece of furniture and a wall. As a result, in order to clean these areas thoroughly, it is necessary to replace the brush with a nozzle attachment which will allow the user to reach those areas which are difficult to access.

[0005] In other cases, in order to create extensive surfaces which are accessible for conventional cleaning brushes, the user has to resort to moving the furniture, where possible, and this involves effort and a waste of time.

[0006] With normal cleaning devices, therefore, at least two cleaning accessories usually have to be used: a larger one, to clean extensive surfaces, and a smaller one to clean surfaces which are difficult to reach.

[0007] Apart from the considerable increase in costs, this also entails difficulty in finding the parts, a waste of time to equip the cleaning device and install the chosen accessory, and problems of space, all of which makes the device less practical to use.

[0008] The present applicant has designed and embodied this invention to overcome the shortcomings of the state of the art and to obtain further advantages.

SUMMARY OF THE INVENTION

[0009] The invention is set forth and characterised in the main claim, while the dependent claims describe variants of the idea of the main embodiment.

[0010] The purpose of the invention is to provide an accessory for cleaning devices, for example a vacuum cleaner, able to change the conformation of the cleaning and/or intake elements simply and quickly in order to adapt them to the size or characteristics of the surface which has to be cleaned.

[0011] With this invention it is possible to improve the versatility and practicality of the cleaning device by

using a single accessory in every situation, eliminating the time wasted by changing the accessories and making the cleaning operations much quicker and less laborious.

[0012] Moreover, the invention makes it easier to keep the accessory when in a temporary state of non-use, inasmuch as it requires a smaller container space.

[0013] The accessory according to the invention can be applied to vacuum cleaners, of the type which ingest solids or liquids or of the multi-functional type, and has a cleaning and/or intake element associated with the end of an intake pipe.

[0014] According to a variant, the cleaning and/or intake element is connected to the pipe by articulated joints which make it easier to handle and to move.

[0015] According to a variant, the cleaning and/or intake element has auxiliary cleaning means on the lower part, for example brushes, fabric, etc., suitable to cooperate with the surface which has to be cleaned.

[0016] According to the invention, the cleaning and/or intake element is associated with means to vary its cleaning and intake surface on command.

[0017] According to the invention, the cleaning and/or intake element has at least a closed position wherein it occupies a minimum space, in order to clean surfaces which are difficult to access, and a position of maximum opening wherein it occupies a maximum space in order to accelerate the cleaning of extensive surfaces.

[0018] According to a variant, the cleaning and/or intake element can assume and maintain any position whatever included between the closed position and the maximum opening position; this makes the cleaning device more versatile and more adaptable to the sizes and/or conformation of the surface which has to be cleaned.

[0019] By varying the intake surface, moreover, it is possible to vary the cleaning capacity of the accessory so as to adapt it, for example, to the type of surface to be cleaned or the degree of cleaning required.

[0020] In one embodiment, the cleaning and/or intake element has a central body associated, on at least one side, with movable parts suitable to assume a first closed position close up against the central body and a second open position which widens from the central body until it reaches a position of maximum opening.

[0021] According to a variant, as the movable parts widen from the central body; they open a plurality of blade elements arranged like an accordion adjacent to each other. Towards the outside and at the lower part, the blade elements include a layer of porous material, or other suitable material, which has the function of arranging itself substantially orthogonal to the surface to be cleaned, so as to define the closed volume inside which the depression determined by the intake pipe is generated.

[0022] The layer of porous material has characteristics such as to allow the aforesaid movable parts, and the relative blade elements, to close, without affecting

the overall bulk of the cleaning and/or intake element.

[0023] According to the invention, the movable parts are opened and closed by remote control by the user by means of the appropriate control means, for example a lever, located in the upper part of the accessory advantageously in correspondence with or in proximity of the handle.

[0024] In one embodiment, these actions command a system of pulleys, the movements of which cause the movable parts to open and close.

[0025] According to a variant, the system of pulleys cooperates with toothed wheels and/or transmission belts which drive rods oscillating lengthwise and associated with the movable parts.

[0026] According to a further variant, these actions command hinges driving rods oscillating lengthwise and associated with the movable parts.

[0027] According to another variant, the central body and/or the movable parts include on the lower part brushes made of bristles or at least a layer of porous material.

[0028] According to another variant, the system to open the movable parts comprises at least an electric motor which is governed by the activation of a button located near the handle of the cleaning device

BRIEF DESCRIPTION OF THE DRAWINGS

[0029] The attached Figures are given as a non-restrictive example and show some preferential embodiments of the invention as follows:

- Fig. 1 shows a side view of a cleaning accessory adopting the embodiment according to the invention;
- Fig. 2a is a part cutaway view of the section from A to A of Fig. 1 in a first working configuration;
- Fig. 2b shows Fig. 2a in a second working configuration;
- Fig. 3a shows a variant of Fig. 2a in a first working configuration;
- Fig. 3b is a part view of the accessory shown in Fig. 3a in a second working configuration;
- Fig. 4a shows another variant of Fig. 2a in a first working configuration;
- Fig. 4b is a part view of the accessory shown in Fig. 4a in a second working configuration.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

[0030] Fig. 1 shows a part view of an embodiment of the cleaning accessory 10 according to the invention, including a corrugated pipe 11 which is connected to the drive organ of the cleaning device, for example a vacuum cleaner, which is not shown here.

[0031] An intake pipe 12 is connected by its upper end to the corrugated pipe 11 and by its lower end to the

cleaning and/or intake element 14, by means of articulated joints 13.

[0032] In this case, the cleaning and/or intake element 14 is associated with drive means 15, which also modify the configuration, in this case with a lever 20, located on the handle of the intake pipe 12.

[0033] By acting on the drive means 15, the user can make the cleaning and/or intake element 14 occupy a minimum space, as shown in Fig. 2a, which allows the user to reach surfaces which are difficult to access, or a greater space, as shown in Fig. 2b, which facilitates and accelerates the cleaning of more extensive surfaces.

[0034] The cleaning and/or intake element 14 includes a central body 16 equipped at the upper part with the intake aperture 17 by means of which it is connected to the intake pipe 12.

[0035] On opposite sides of the central body 16 movable arms 18 are associated, in the case of Figs. 2a-2b by means of a respective pin or hinge element 19; the arms 18 are able to open, oscillating around the respective pin element 19, towards the outside of the central body 16.

[0036] To be more exact, the movable arms 18 can move from a closed position 18a (Fig. 2a) to a position of maximum opening 18b (Fig. 2b) and vice versa, on the activation of the lever 20.

[0037] The pin elements 19 tend to maintain the movable arms 18 elastically in the open position 18b; the arms 18 are maintained stably in the closed position 18a by rapid attachment/detachment means 28 which temporally constrain the relative movable arm 18 to the central body 16 of the cleaning and/or intake element 14.

[0038] In the embodiment shown in Figs. 2a-2b, the rapid attachment/detachment means 28 cooperate with a hook element 27 included at the outer end of each movable arm 18; when the movable arm 18 is in the closed position 18a, the hook element 27 is temporally constrained to the central body 16 in the manner described hereinafter.

[0039] According to the invention, when the movable arms 18 are in the open position 18b, they define a surface with a circular sector defined by a plurality of triangular elements 21 consisting of adjacent blades which can be opened like an accordion.

[0040] The triangular elements 21 have the sole function of increasing the intake surface of the cleaning and/or intake element 14; they are very limited in thickness and have the advantage of being very much lighter than conventional cleaning accessories.

[0041] The triangular elements 21, associated with each other in correspondence with the catheti, include in correspondence with their base a continuous thin layer 22 made of porous material. The continuous layer 22 is arranged substantially orthogonal to and in contact with the surface to be cleaned, delimiting the volume wherein the depression is created to remove the dust or dirt in general.

[0042] The elasticity and flexibility of this layer, moreover, allows the movable arms 18 to move without resistance to the closed position 18a.

[0043] The lever 20 for the drive means 15 commands a cord 23, which is able to slide inside a sheath 24 housed inside the appropriate longitudinal space included on the intake pipe 12.

[0044] In Figs. 2a-2b, the cord 23 makes an inner pulley 25 rotate.

[0045] The inner pulley 25 is coaxial with an outer pulley 26, with a larger diameter, cooperating with two tie rods 29 attached to the outer end of the relative movable arm 18.

[0046] Starting from the configuration shown in Fig. 2b, that is, with the movable arms 18 in the open position 18b, by activating the lever 20, the cord 23 is put under tension, which makes the inner pulley 25 rotate, in this case in a clock-wise direction.

[0047] The inner pulley 25 in turn makes the outer pulley 26 also rotate, either in the same direction as or in the opposite direction to the inner pulley 25. The outer pulley 26 drives the tie rods 29 which, cooperating with little guide wheels 30, take the movable arms 18 to the closed position 18a on the central body 16.

[0048] In the closed position 18a, the hook elements 27 are retained by the rapid attachment/detachment device 28; this allows the inner pulley 25 to return to the initial position without interfering with the outer pulley 26, rewinding the cord 23 and allowing the lever 20 to return to the release position.

[0049] In this case, the lever 20 is elastic and, if it is not held by the user, it tends to assume the release position spontaneously.

[0050] According to a variant the cord 23 is associated, at an intermediate position, with spring means which prevent it from breaking due, for example, to an excessive tension; they also facilitate the setting of the rapid attachment/detachment means 28 of the movable arms 18.

[0051] According to the invention, the inner pulley 25 is able to transmit motion to the outer pulley 26 only when it is rotating in a determined direction, in this case in a clock-wise direction, thus allowing the movable arms 18 to be maintained in the closed position 18a, as shown in Fig. 2a, even when the lever 20 is released.

[0052] When the lever 20 is subsequently activated, the inner pulley 25 begins to rotate again, still in a clock-wise direction, but this time it drives the rapid attachment/detachment means 28 which, releasing the hook elements 27 of both movable arms 18, allow the latter to return to the open position 18b.

[0053] It is thus possible to vary the horizontal bulk of the cleaning and/or intake element 14 every time the lever 20 is activated, allowing the user to vary the bulk of the element 14 with minimum effort and maximum speed.

[0054] Moreover, with this embodiment the user is not obliged to hold the lever 20 under traction so as to keep

the movable arms 18 in a desired position, for example, the closed position 18a.

[0055] According to the invention, the pulleys 25, 26, the guide wheels 30 and the rapid attachment/detachment means 28 are housed inside an appropriate compartment, separate and sealed with respect to the intake aperture 17, so that it is possible to prevent malfunctioning of the mechanical parts due to the accumulation, for example, of dust or other particles removed from the surfaces cleaned.

[0056] In the case shown in Figs. 2a-2b, the rapid attachment/detachment means 28 consist of an elastic arm 31 oscillating and mounted on the pulley 26, defining a housing seating 31a for the tooth of the hook element 27.

[0057] When the tooth of the hook element 27 is inserted into the seating 31a, the movable arm 18 is clamped on the central body 16.

[0058] The unclamping command is given when the pulley 26 is made to rotate, thus freeing the contact between the arm 31 and the hook element 27 and allowing the movable arm 18 to return elastically to the open position 18b.

[0059] According to a variant, the rapid attachment/detachment means 28 are located on the frame of the central body 16 and/or on the inner pulley 25.

[0060] In the variant shown in Figs. 3a-3b the cord 23 takes into rotation, in the manner described above, the inner pulley 25 which in turn drives the outer pulley 26.

[0061] The outer pulley 26 drives two toothed wheels, respectively 32a and 32b, which transmit motion by means of transmission belts 33 to respective toothed wheels 34.

[0062] In this case, between the pulley 26 and the toothed wheel 32b there is a supplementary toothed wheel 132b to make the toothed wheel 32b rotate in the opposite direction to that of the toothed wheel 32a.

[0063] The toothed wheels 34, in turn, drive respective toothed wheels 35 to which a respective drive rod 36 is radially associated; the drive rod 36 is free to slide inside a mating guide 37 solid with the respective movable arm 18.

[0064] In this embodiment, when the lever 20 is acted on, the drive rods 36 move from an open position in which they arrange the movable arms 18 substantially orthogonal to the central body 16 (position 18b, Fig. 3a) to a closed position wherein they arrange the movable arms 18 substantially parallel to the central body 16 (position 18a, Fig. 3b) and vice versa.

[0065] In this variant, the rapid attachment/detachment means 28 comprise an oscillating arm 131 at the end of which there is a wheel 38 associated; when the movable arms 18 are in the closed position, the wheel 38 retains a hook element 127 (Fig. 3b).

[0066] When the outer pulley 26 is subsequently rotated, as the lever 20 is activated, it is possible to activate the oscillating arm 131 to free the wheel 38 from contact with the hook element 127 and return the mov-

able arm 18 to its open position 18b.

[0067] In the embodiment shown in Figs. 4a-4b too, the movable arms 18 are moved by means of respective drive rods 36 cooperating with guides 37 solid with the movable arms 18.

[0068] In this embodiment, the drive rods 36 are radially associated with pins 119 made to rotate by an elastic system comprising two hinges, respectively 46a and 46b.

[0069] To be more exact, the cord 23 driven by the lever 20 is associated with a command rod 39, which in turn is elastically associated with the central body 16 by means of springs 40; the command rod 39 is able to slide between mating lateral guides 41.

[0070] The wings 42a of a U-shaped rod element 42 also slide between the lateral guides 41, when driven by the command rod 39.

[0071] On the central side 42b of the rod element 42 there are two annular elements 43 inside which mating retention elements 44 are inserted, as will be described hereafter, the retention elements 44 being part of the rapid attachment/detachment means 28; there are also two springs 45 solidly associated with the central body 16 of the cleaning and/or intake element 14.

[0072] The free end of the wings 42a of the rod element 42 is associated with a pair of hinges 46a, 46b which make the pin 119 rotate when driven by the wings 42b (Fig. 4b); there are oscillations of the drive rod 36 corresponding to the rotations of the pin 119, and therefore of the movable arm 18.

[0073] A first translation of the lever 20 makes the command rod 39 translate forwards which in turn pushes the rod element 42 towards the front part of the central body 16; when the annular elements 43 are in correspondence with the retention elements 44 they are retained by the latter so that the drive rod 36 is maintained in a position substantially parallel to the central body 16 with the movable arms 18 in the closed position 18a.

[0074] In this condition, the springs 40 are under tension. When the user releases the lever 20, the springs 45 return the command rod 39 to the initial position (Fig. 4b).

[0075] A subsequent traction of the lever 20 makes the command rod 39 advance again; it pushes the rod element 42 against the rapid attachment/detachment means 28, causes the retention elements 44 to be released from the annular elements 43 and therefore it allows the springs 40 to return the rod element 42 to its original position.

[0076] As it returns, the rod element 42 drives the hinge 46a which in turn acts on the hinge 46b, making the pin 119 rotate until it returns the drive rod 36 orthogonal to the central body 16 and therefore the movable arms 18 to the open position 18b.

[0077] The triangular elements 21 are associated, in correspondence with their inner end, with fixed, rectangular rods 47 which allow the triangular elements 21 to

close.

[0078] According to the invention, the accessory 10 can include on its lower portion brushes or other means which facilitate the removal of dirt.

Claims

1. Accessory for cleaning device of the domestic or industrial type, the device able to be a vacuum cleaner of the type for solids, liquids or multi-functional, the accessory including at least an intake pipe (12) equipped with means (11) to connect it to the drive organs of the cleaning device and a cleaning and/or intake element (14) connected at the lower part to the intake pipe (12) with joint or articulated joint means (13), the accessory being characterised in that the cleaning and/or intake element (14) includes a first operating position occupying a minimum space and a second operating position occupying a maximum space, the transition from the first to the second position being governed by the activation of drive means (15) cooperating with the handle of the intake pipe (12).
2. Accessory as in Claim 1, characterised in that the cleaning and/or intake element (14) comprises a central body (16) connected to the intake pipe (12) by means of an intake aperture (17) and at least a movable arm (18) oscillating laterally with respect to the central body (16), the movable arm (18) including a first closed position (18a) close up against the central body (16) and a second position of maximum opening (18b) far removed from the central body (16).
3. Accessory as in Claim 1 or 2, characterised in that the movable arm (18) is connected to the central body (16) by a plurality of blade elements (21) which can be opened/closed like an accordion.
4. Accessory as in Claim 3, characterised in that the blade elements (21) include a layer (22) of porous material on their lower part.
5. Accessory as in any claim hereinbefore, characterised in that the drive means (15) comprise lever means (20) which are accessible to the user and which drive a system of pulleys (25, 26), the system of pulleys (25, 26) acting on tie rods (29) which connect the movable arm (18) to the central body (16) passing through the plurality of blade elements (21).
6. Accessory as in any Claim from 1 to 3 inclusive, characterised in that the drive means (15) comprise lever means (20) which are accessible to the user and which drive a system of pulleys (25, 26), the system of pulleys (25, 26) acting on toothed wheels

(32a, 32b, 132b, 34, 35) which drive a rod (36) oscillating lengthwise associated with a respective movable arm (18).

7. Accessory as in any Claim from 1 to 3 inclusive, characterised in that the drive means (15) comprise lever means (20) which are accessible to the user and which drive at least an elastic command rod (39), the command rod (39) driving at least a rod element (42) cooperating with hinge elements (46) driving a rod (36) oscillating lengthwise associated with a respective movable arm (18). 5 10
8. Accessory as in any claim hereinbefore, characterised in that the movable arm (18) includes attachment means (27, 127) to attach it to the central body (16). 15
9. Accessory as in any claim hereinbefore, characterised in that the central body (16) includes means (31, 38, 44) to retain the movable arm (18). 20
10. Accessory as in Claim 9, characterised in that the retention means (31) are made on one of the pulleys (25, 26). 25
11. Accessory as in Claim 9, characterised in that the retention means (38) are made on the frame of the central body (16). 30
12. Accessory as in Claim 9, characterised in that the retention means (44) cooperate with the rod element (24) and/or the hinge elements (46) to drive the oscillating rod (36). 35
13. Accessory as in any claim hereinbefore, characterised in that the freeing of the attachment means (27, 127) and the retention means (31, 38) is functionally connected to the rotation of the system of pulleys (25, 26). 40

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